Comparison of Age and Life-History Estimates determined using Otoliths, Fin Rays, and Scales of Sea Run Coastal Cutthroat Trout in Puget Sound

*Andrew Claiborne[1], James Losee[1], Jessica Miller[2] and Lance Campbell[1]

[1]Washington Department of Fish and Wildlife, Fish Program, Olympia, WA
Presenting author (email: Andrew.Claiborne@dfw.wa.gov)

[2]Oregon State University, Hatfield Marine Science Center, Coastal Oregon Marine Experiment Station, Newport, OR

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Coastal Cutthroat Trout Life History Diversity & Scale Analysis

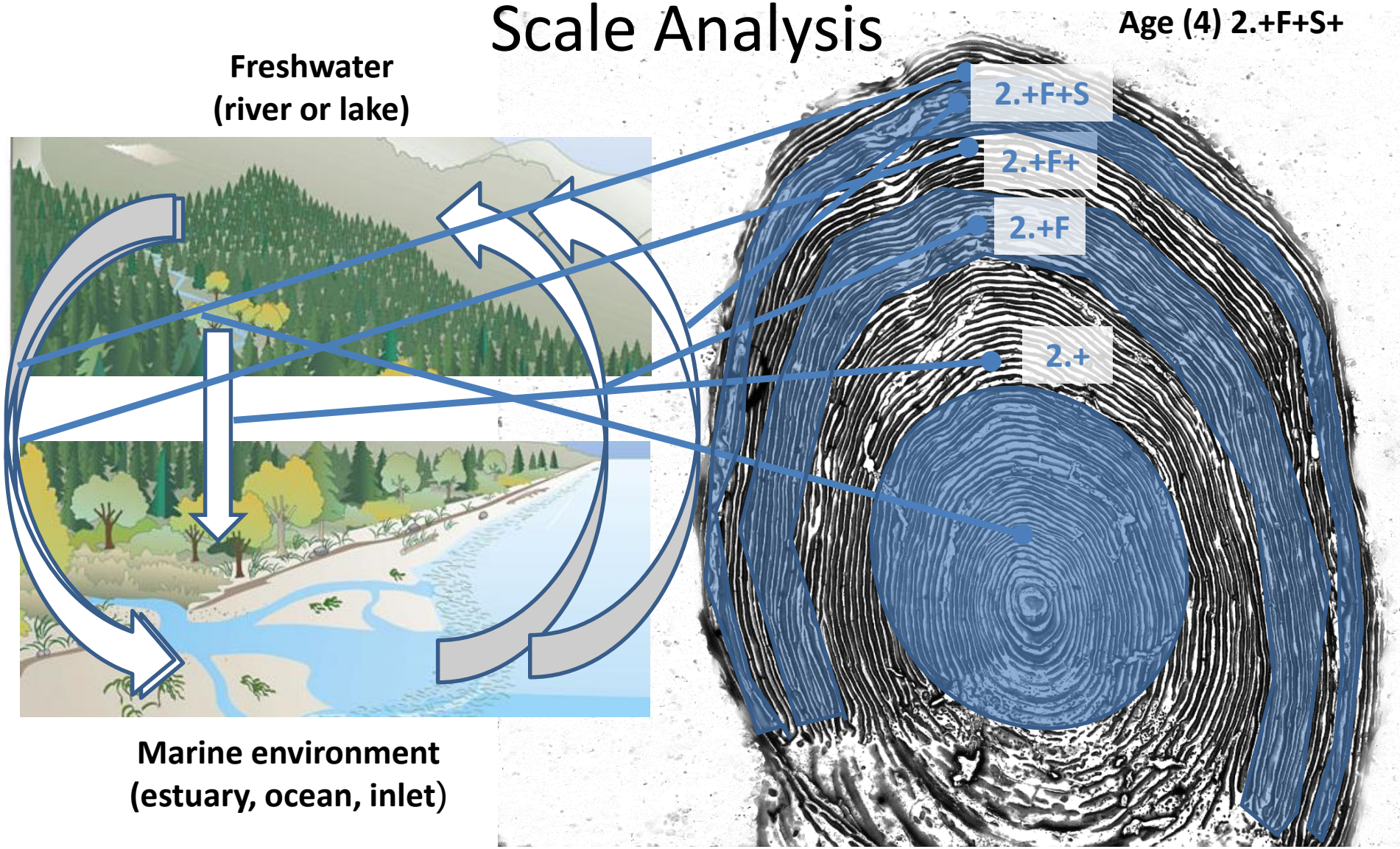
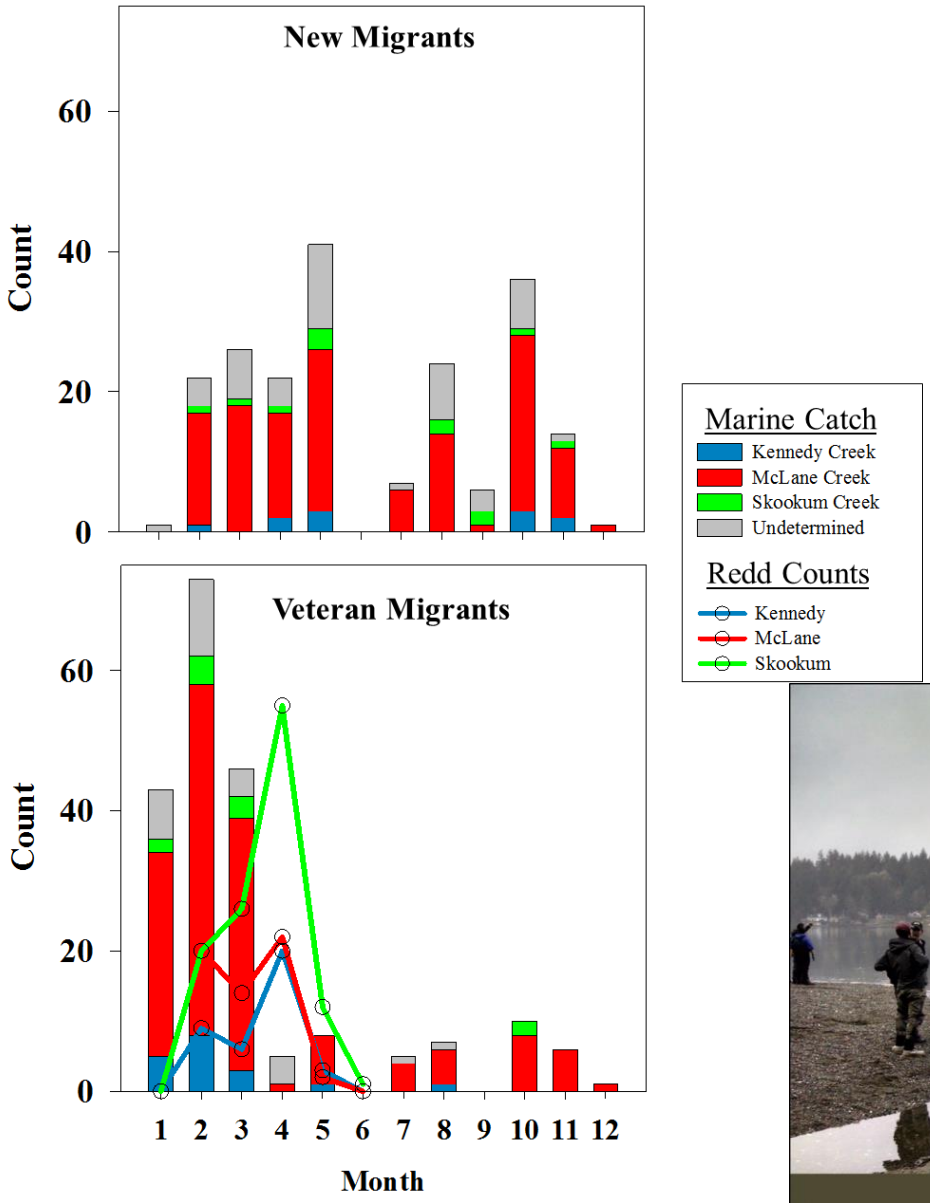


Figure USGS

Coastal Cutthroat Trout South Puget Sound



Losee et al. 2018

Catch new and veteran migrants in marine waters all year

Spawning is protracted (6 months)

Objective

Use a combination of traditional ageing techniques and elemental chemistry of otoliths to evaluate life-history and total age

Study Area

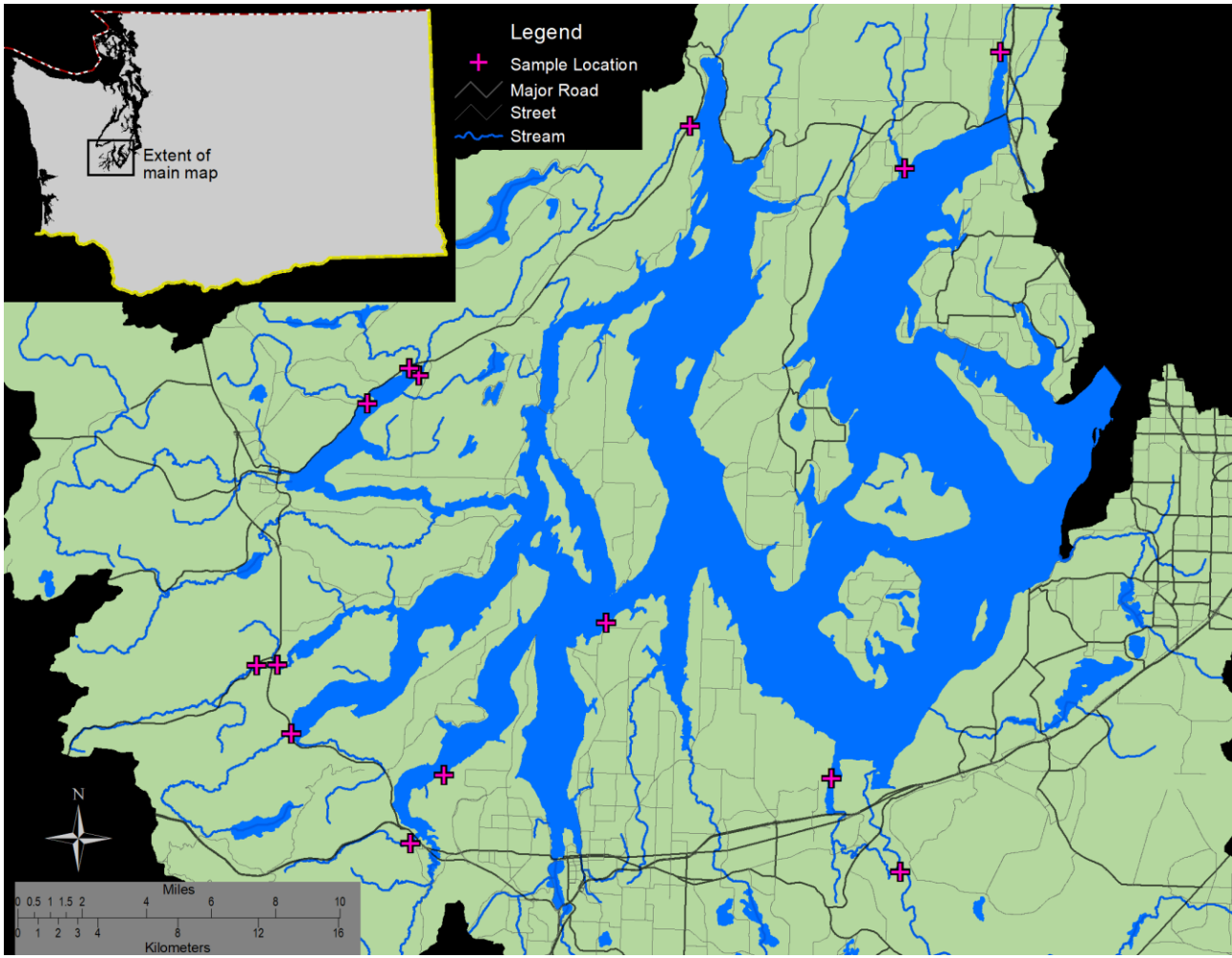
South Puget Sound

2015-2018

Opportunistic sampling n=49

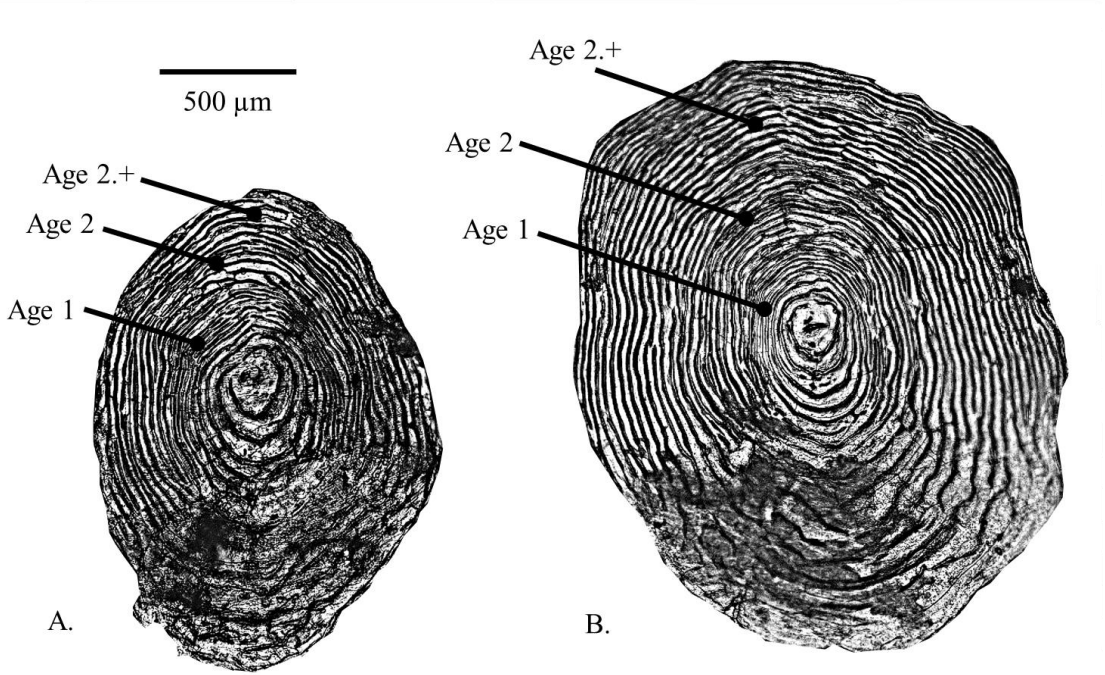
Spawning Grounds, Traps

Marine Environment, beach seine, hook and line



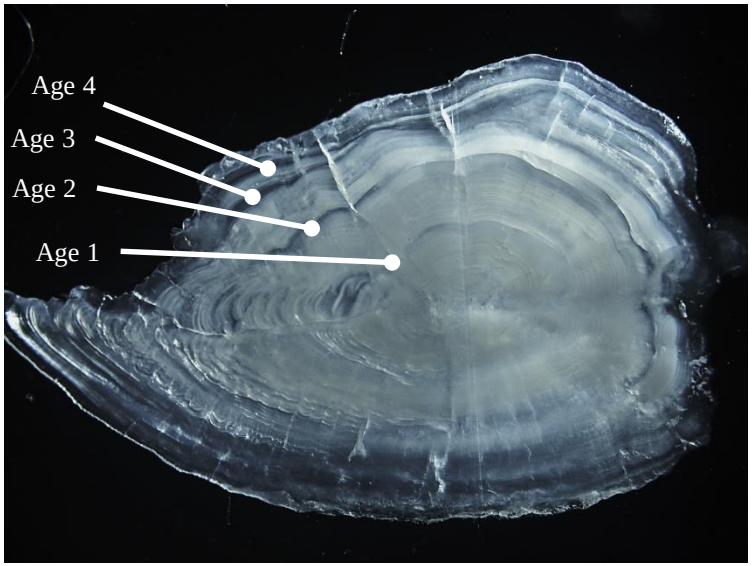
Map by Dale Gombert, WDFW

Age and Migrations



Scales

1. Annuli, circulli spacing & resorption
2. Fixed LH



Otoliths

1. Annuli
2. Patterns of Strontium:Calcium

Total Age Results

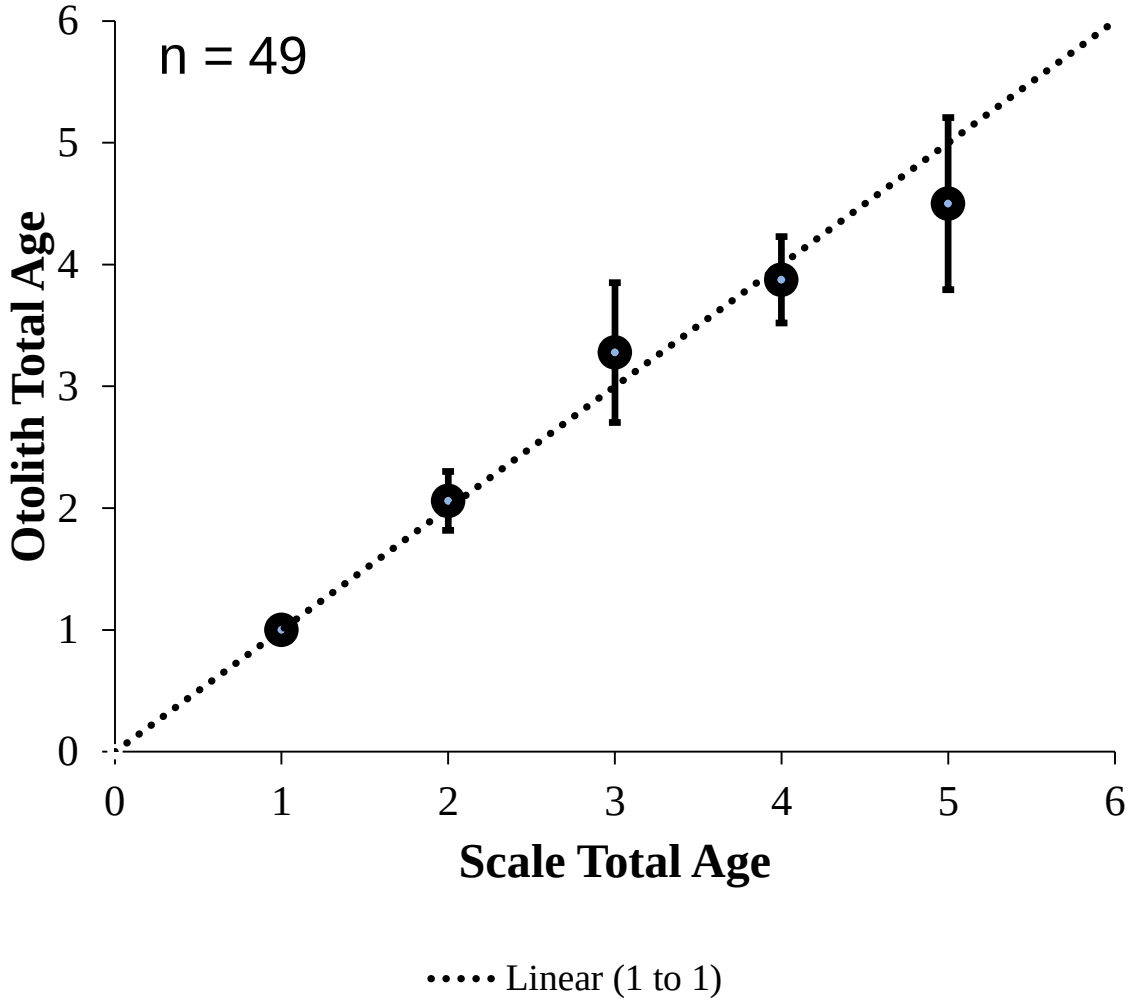
Agreement = 85.71%

CV = 3.27%

APE Index = 2.31%

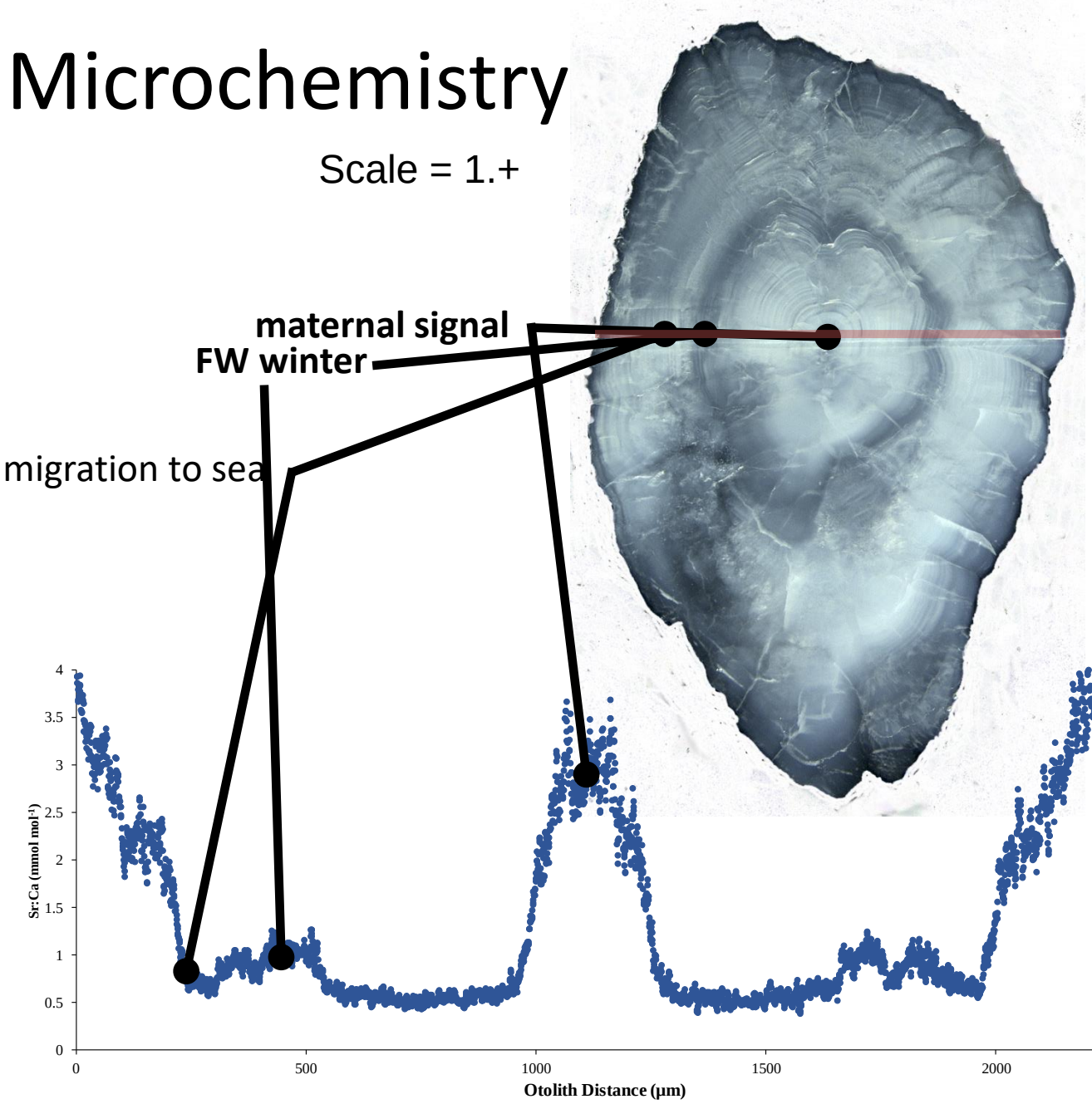
100% of age within 2 years

Most disagreements related to freshwater age



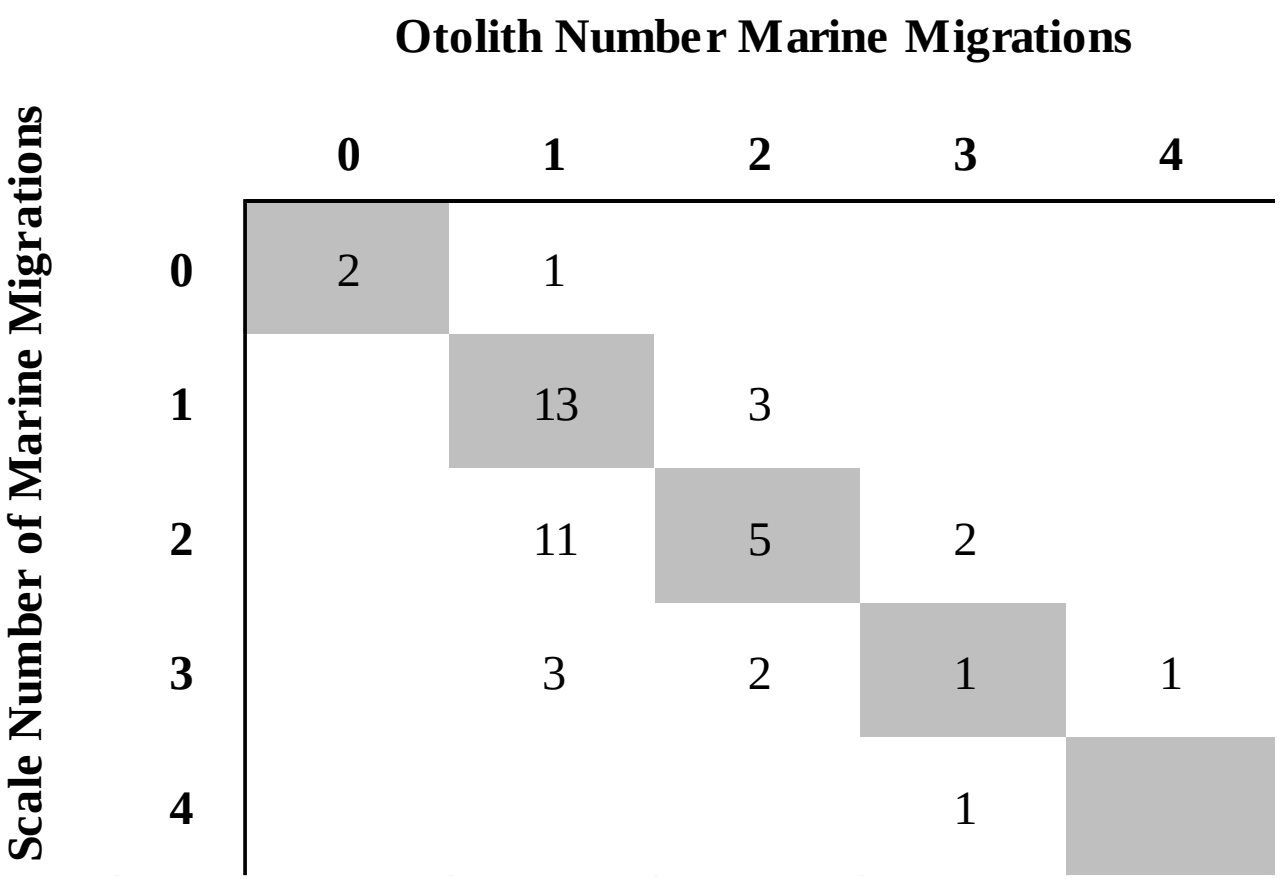
Otolith Microchemistry

1. Elements in water incorporated in otolith, metabolically inert
2. Sr:Ca higher in marine waters
3. LA-ICPMS
4. Number of migrations to marine & Maternal origin



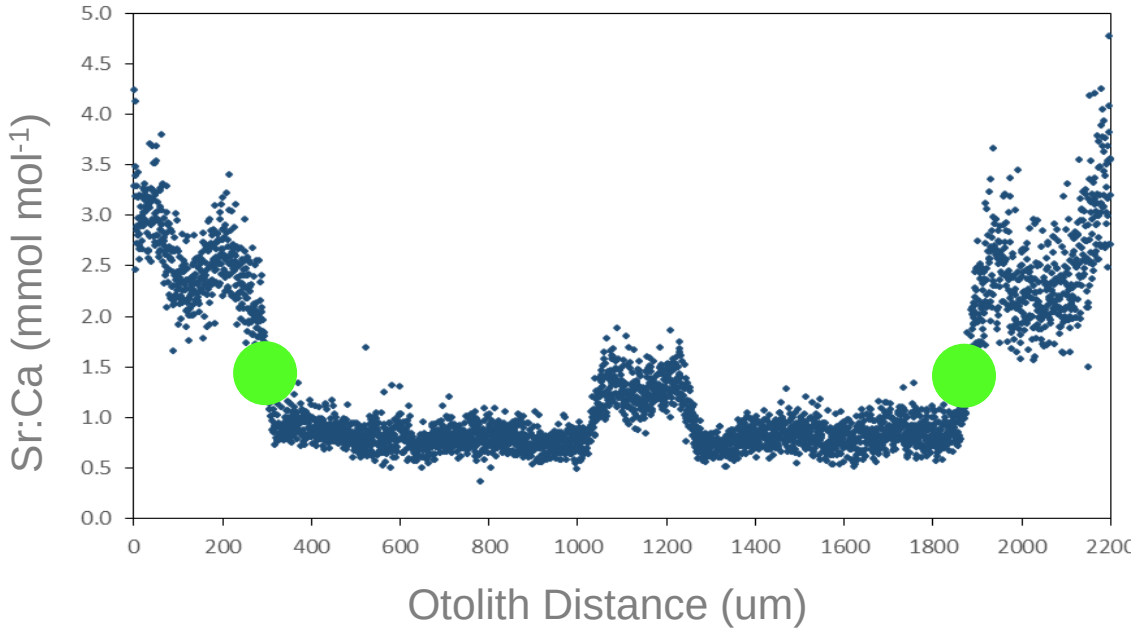
Life History Results

1. 47% agreement between otolith and scale life history
2. Some fish moving more frequently into freshwater
3. Some fish overwintering in marine waters 1-2 yrs



Scale Number of Marine Migrations	Otolith Number Marine Migrations 0	1	2	3	4
0	2	1			
1		13	3		
2		11	5	2	
3		3	2	1	1
4				1	

Life History Results



Scale LH
2.+
1 migration to sea

VS

Otolith LH
1 migration to sea

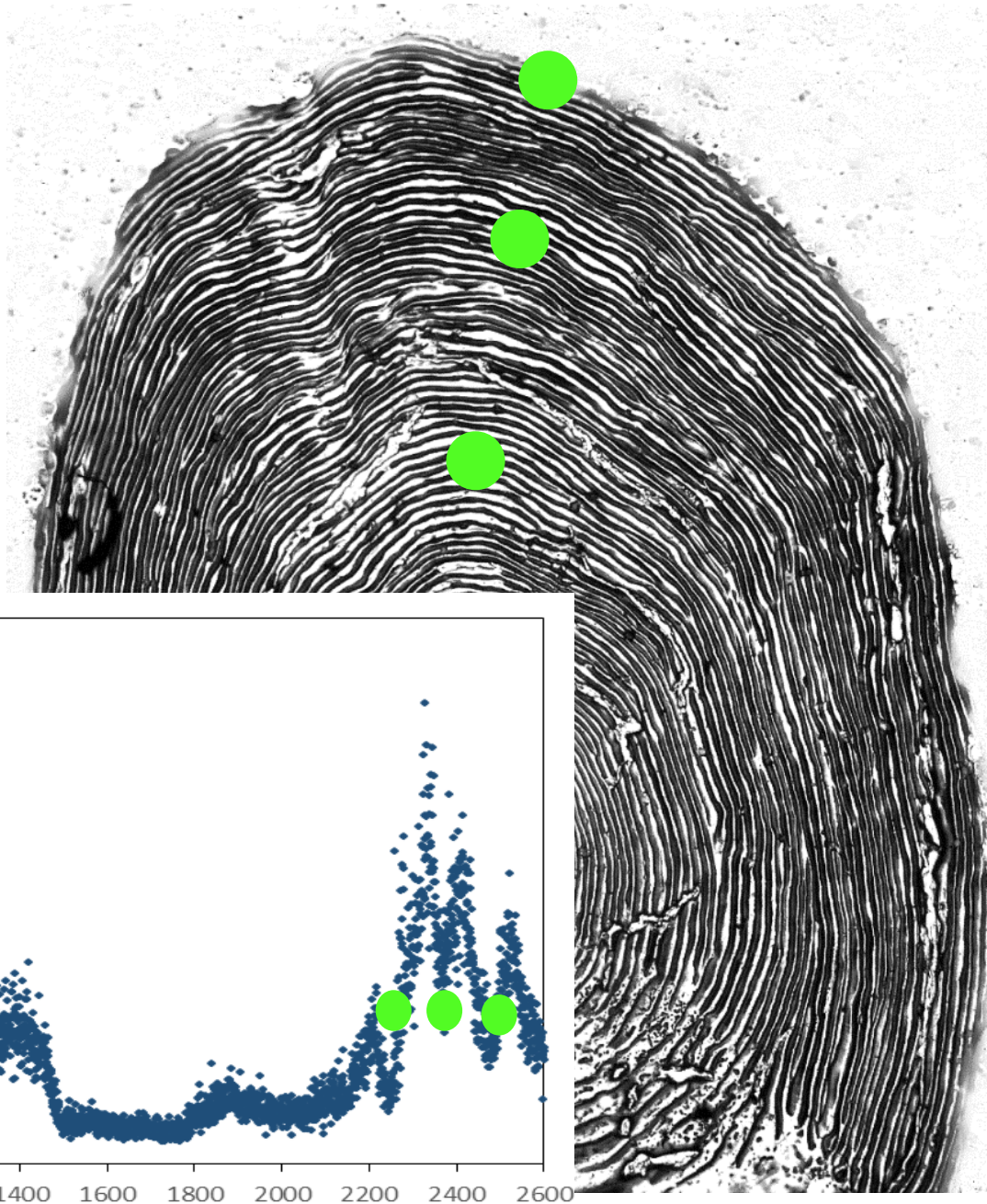
250 mm, Undeveloped, ID 51

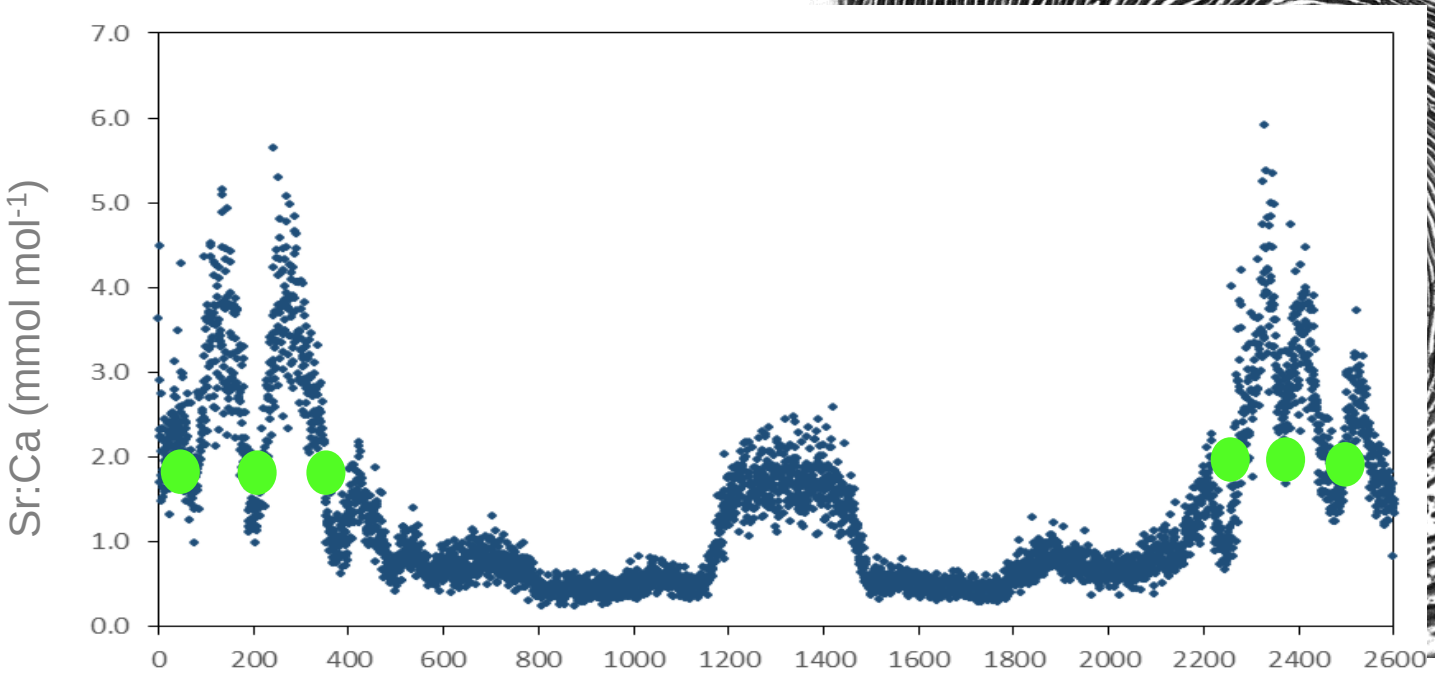
Life History Results

Scale LH
2.+F+S+
3 migrations to sea

VS

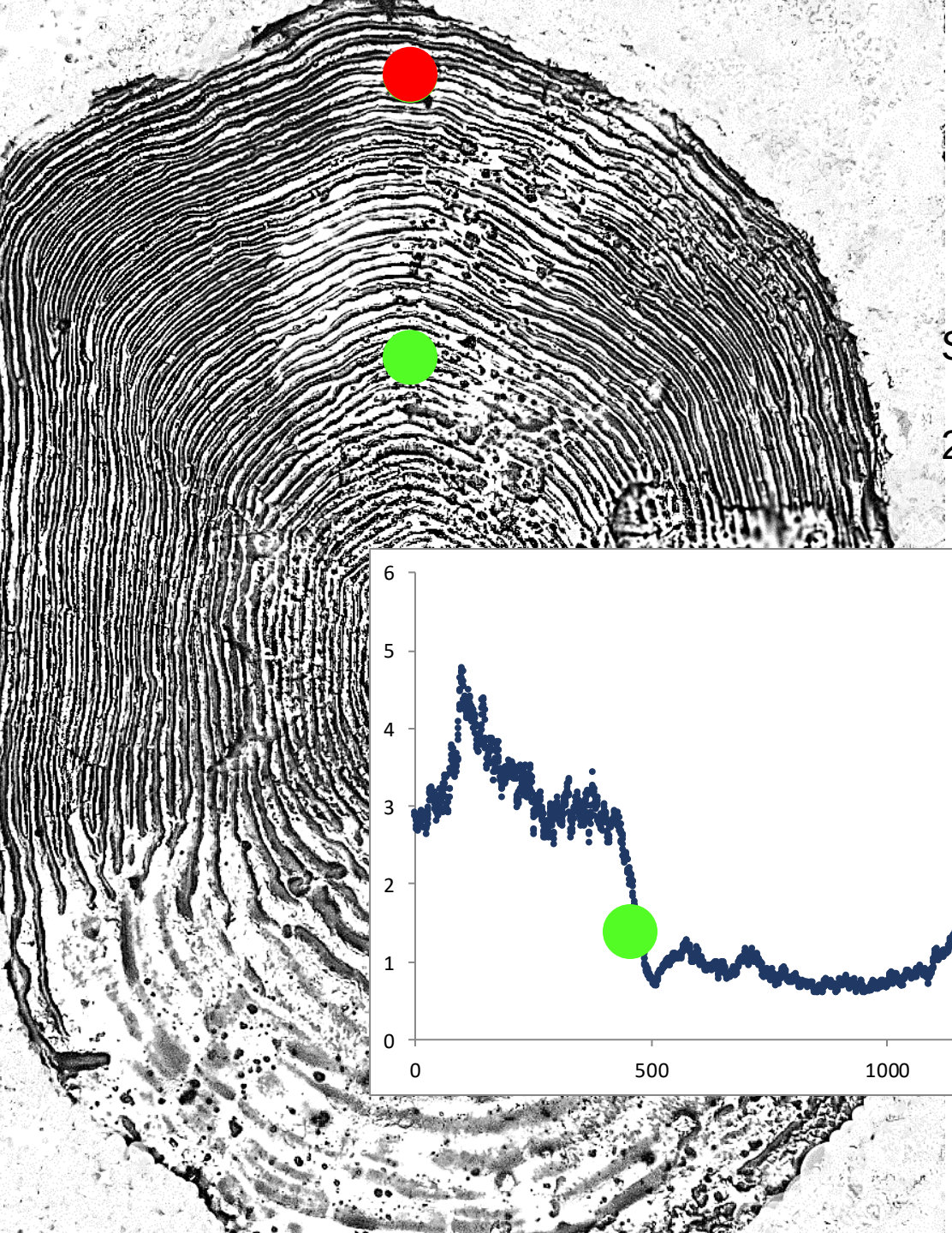
Otolith LH
3 migrations to sea





398 mm, F, ID 58

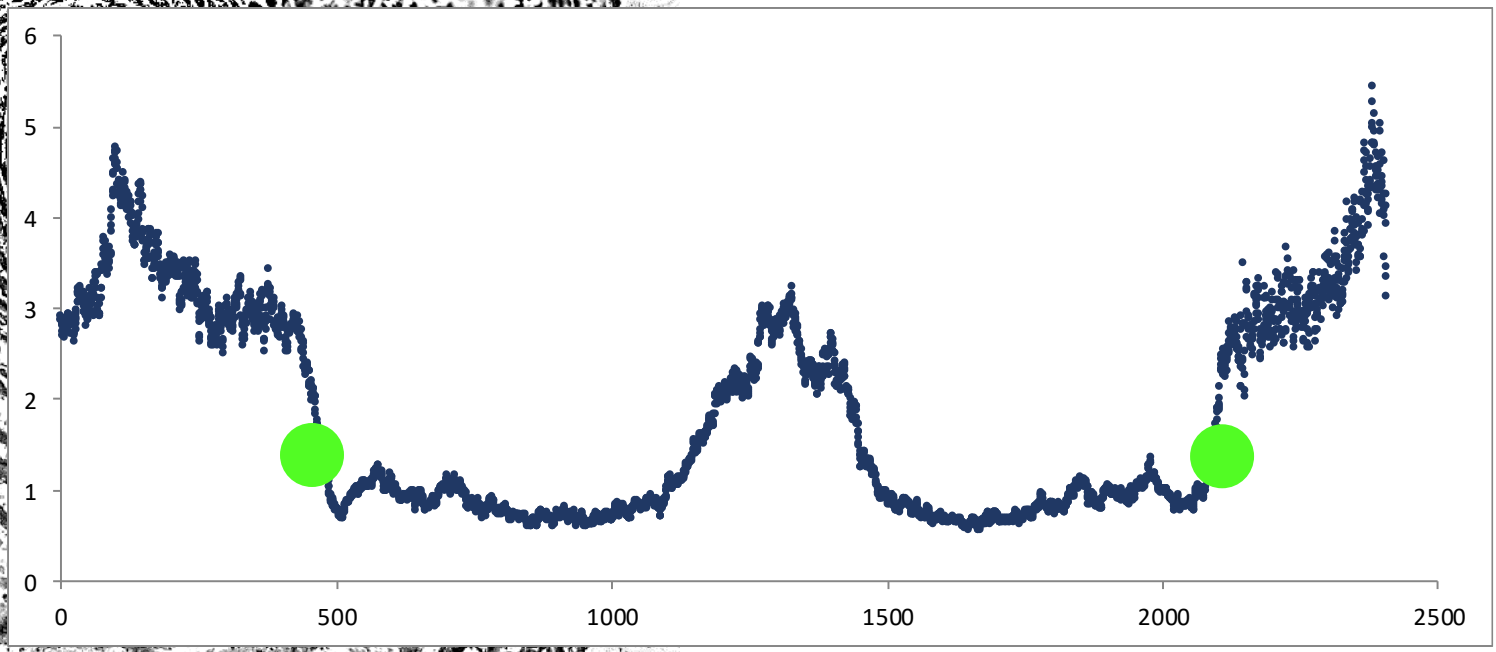
Life History Results



Scale LH
2.+F+
2 migrations

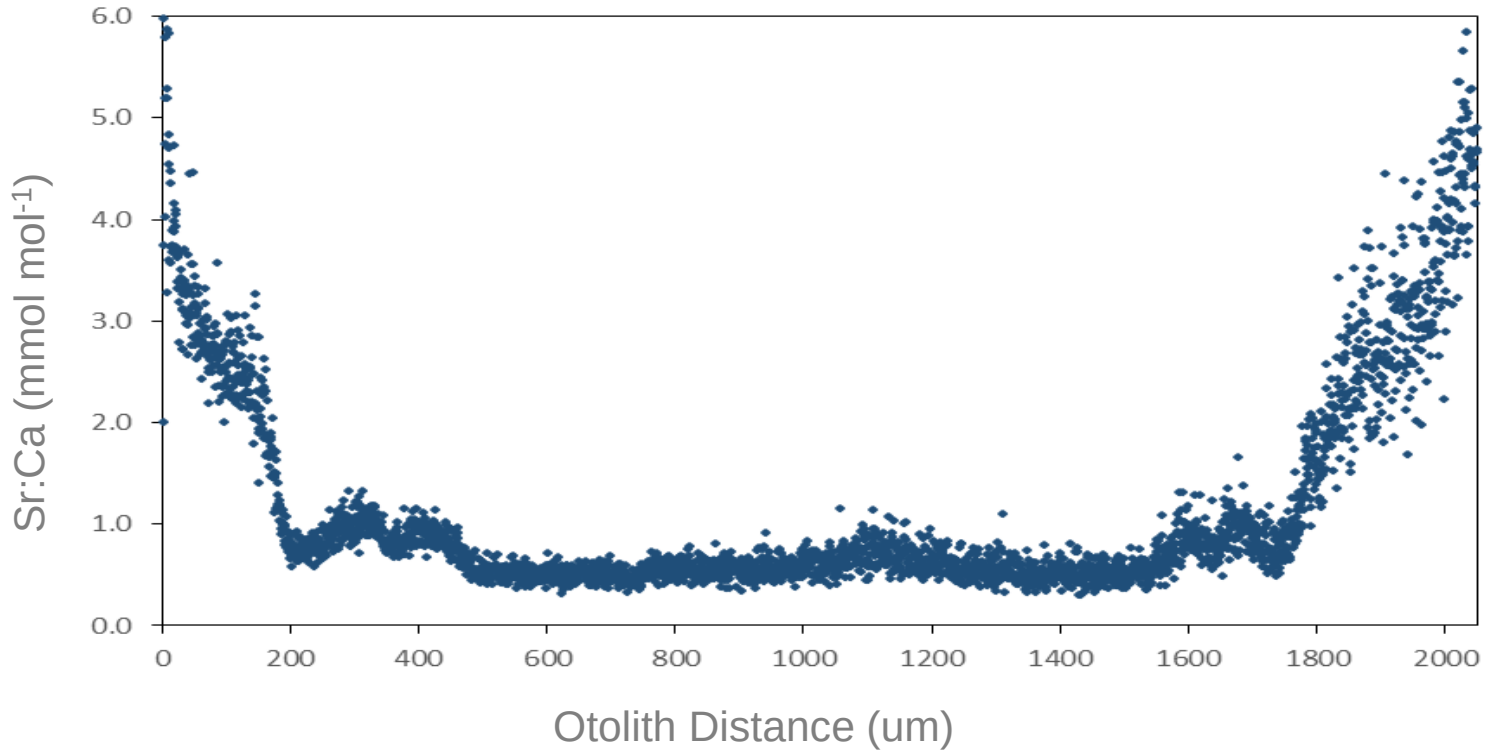
VS

Otolith LH
1 migrations



340 mm, F,
2/26/2015, ID 42

Maternal Origin Results

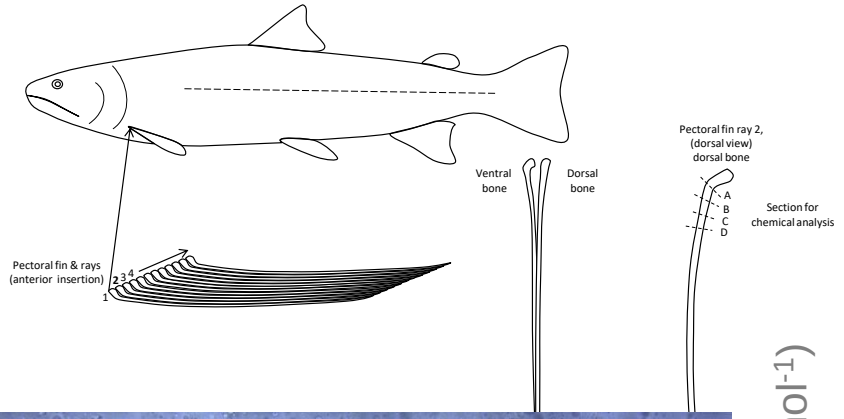


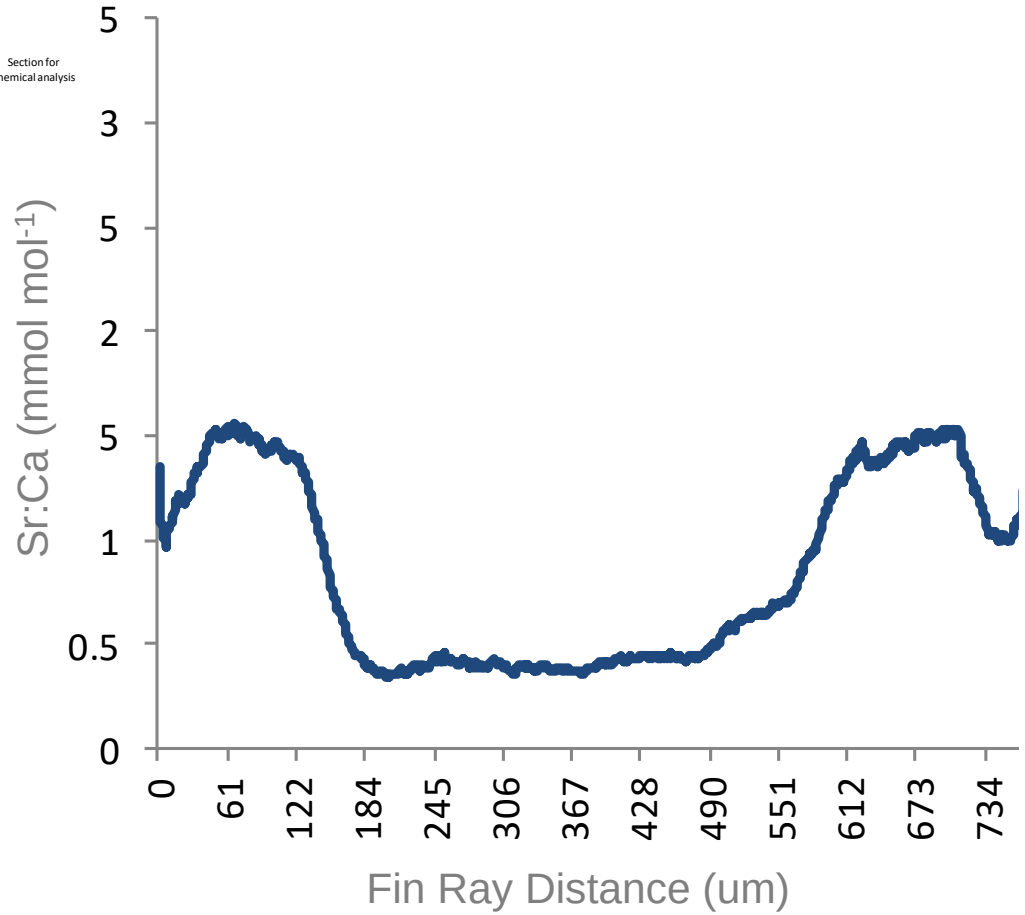
19% of fish from resident mother or mother who matured in freshwater

Discussion

- Total age was corroborated between scales and otoliths
- Otolith chemistry provided some validation of scale calls, but highlight the diversity of life history and limitations of scales
- Evaluate life history using non-lethal fin ray microchemistry

Fin ray chemistry

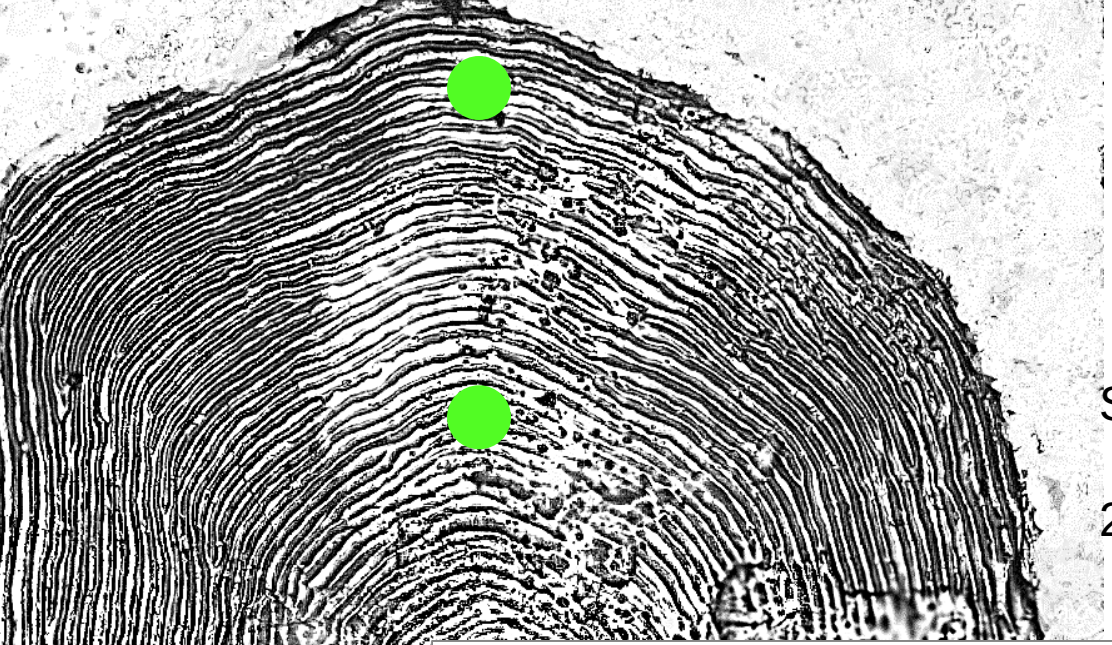




Questions?

Coastal Cutthroat Trout
Oncorhynchus clarki clarki

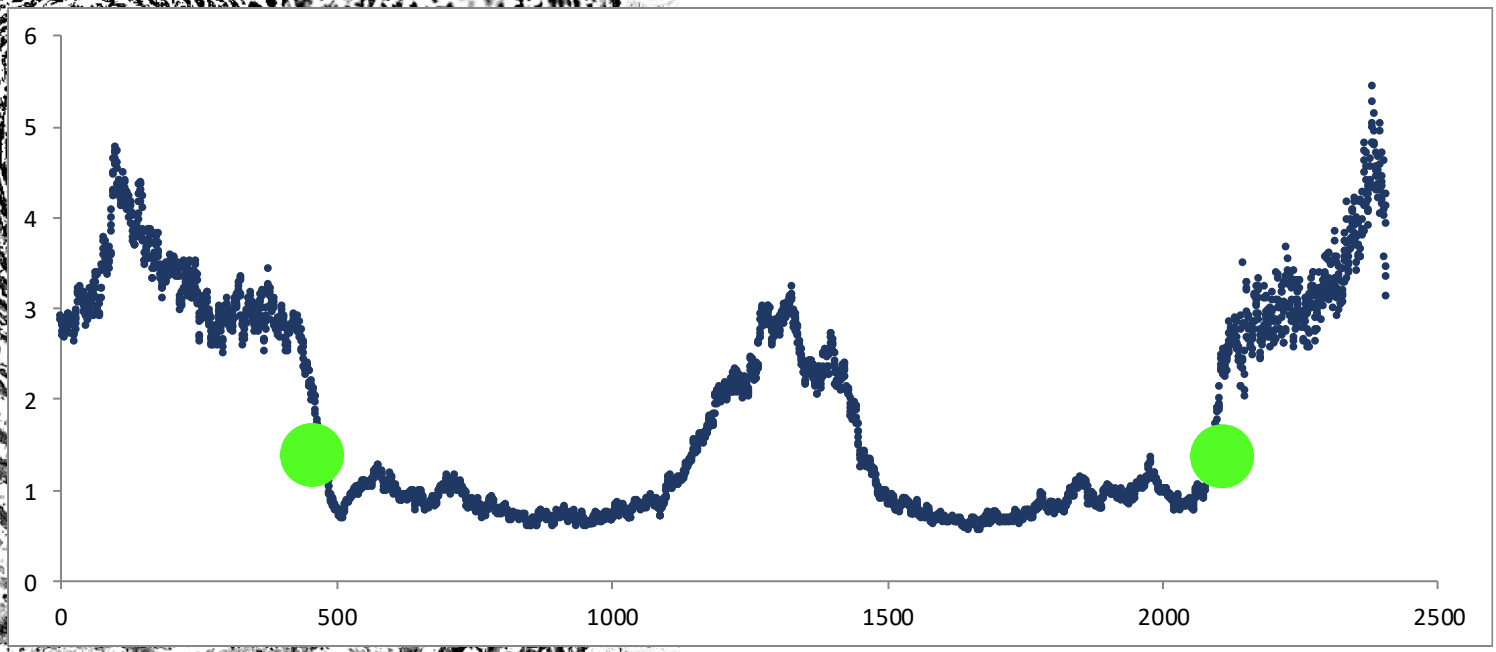
Life History Results



Scale LH
2.+F+
2 migrations

VS

Otolith LH
1 migrations



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